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Interim Guidance for Evaluating Lead-Based Paint and Asbestos-Containing Materials At Proposed School Sites

California Department of Toxic Substances Control
California Environmental Protection Agency

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1.0 INTRODUCTION

Laws affecting school construction were recently enacted: Assembly Bill 387, Senate Bill 162, and Assembly Bill 2644. These statutes require the California Department of Toxic Substances Control (DTSC) to assume responsibility for evaluating environmental assessments for proposed school sites that will receive state funding for acquisition and/or new construction. The role of DTSC is to ensure that selected properties do not contain hazardous materials or that these properties have been appropriately remediated for the protection of the children's health, public health, and the environment. In order for DTSC to expeditiously meet these statutory requirements, this guidance has been developed to address specific issues and to provide an assessment for properties where lead-based paint and/or asbestos-containing materials (ACM) are the only potential contaminants. Properties with other suspected contamination must be evaluated under the standard Preliminary Endangerment Assessment (PEA) process.

This document is released as an interim guidance and will be subject to review and revision one year following the release date.

"The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov."

2.0 PURPOSE

This guidance was prepared for proposed school sites previously or presently occupied by structures where the only suspected contamination is lead or ACM. Older structures may contain hazardous construction materials such as lead-based paint or ACM, including ceiling tiles, floor tiles, insulation, sheet rock, thermal system insulation, acoustical plaster, and roof shingles. Asbestos is a term used for several types of fibrous minerals. Exposures to these substances may cause lung disease and cancer. Lead can impair the nervous system, affecting hearing, vision, and muscle control, and it is toxic to kidneys, blood, and heart. Exposure to children can cause irreversible learning deficits, mental retardation, and delayed neurological and physical development.

This guidance is intended to supplement the Phase I Assessment and the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual (DTSC 1994, revised June 1999). In no way is this guidance meant to diminish the need to take authoritative samples at additional site locations commonly associated with on-site and off-site hazardous substance releases, such as chemical storage sheds, vehicle maintenance areas, garages, and septic tanks, nor replace the PEA Guidance Manual. The use of this document is limited to the investigation of contamination derived from lead-based paints and ACM that may potentially be present on properties that are being considered for school construction. This guidance does not limit investigations at sites with a history of other hazardous material uses or industrial land use, and it does not apply to sites with naturally occurring asbestos.

3.0 LIMITED FURTHER ACTION LETTER

For properties where the only potential sources of contamination identified in a DTSC approved Phase I assessment are from lead-based paint and/or ACM, DTSC will provide California Department of Education (CDE) with a letter stating that the only potential concerns with the property are lead and/or ACM. This letter may conclude that limited further action is warranted and the estimated timeframe for completion of that action. For lead-based paint, a PEA will be submitted to DTSC before final DTSC approval. If remediation of the site is required, a removal action workplan will be submitted to DTSC.

4.0 ASBESTOS CONTAINING MATERIALS (ACM)

Sites with residential and/or commercial structures constructed before 1976 may contain ACM. Due to the demand for new schools, many former residential and/or

commercial areas are being considered for proposed school sites. Current redevelopment trends largely involve the demolition of these structures, although, in some cases, structures are renovated and incorporated into the design and construction of the new school.

The mitigation and management of ACM is currently regulated by several federal, state and local agencies. (See Appendix A for a summary of relevant statutory and regulatory requirements). If mitigation and management activities are performed in accordance with the established statutes and regulations, health and safety concerns should be addressed. All asbestos work must comply with California Occupational Safety and Health Administration (CalOSHA) regulations, air district and/or California Air Resources Board (ARB) regulations, as well as any other local ordinances. If ACM is identified at a proposed school site, the school district shall either mitigate or manage ACM in place, pursuant to the established federal, state and local regulations and protocols. If structures containing ACM are to be demolished, removal of ACM must meet all pertinent regulations.

The presence or potential presence of ACM should be identified in the Phase I Assessment. The school districts then assume all responsibility for complying with statutes and regulations regarding ACM. School districts may be required to produce any documentation or certification required under relevant statutes and regulations, if questions arise concerning the handling of ACM. In addition, school districts must be compliant with all relevant hazardous waste statutes and regulations.

If a school district intends to utilize a structure containing ACM and manage the ACM in place, they should proceed in a manner consistent with all applicable federal, state and local regulations for the management of ACM. School districts electing to manage, rather than remove ACM, shall assume all liability and responsibility for managing the sites pursuant to all applicable federal, state and local regulations.

5.0 LEAD-BASED PAINT

Residential and/or commercial structures constructed before 1978 may contain lead-based paint on internal and external surfaces. Redevelopment of these properties for schools generally involves the demolition of these structures, although, in some cases, structures are renovated and incorporated into the design and construction of new schools. If lead-based paint is identified in the Phase I Assessment, school districts shall either mitigate or manage in place, pursuant to the established federal, state and local regulations and protocols. Upon completion of all mitigation and/or management activities, a description of these activities should be included in the PEA or PEA Addendum, along with soil sampling data.

The mitigation and management of lead-based paint is currently regulated by several federal, state and local agencies. (See Appendix A for a summary of relevant statutory and regulatory requirements). If mitigation and management activities are performed in accordance with the established protocols, health and safety concerns should be addressed, with the exception of the potential presence of residual lead contamination in soil. It is DTSC's intention not to duplicate lead safety regulations or other regulatory agency oversight responsibilities. DTSC's role is to confirm that no residual lead soil contamination remains that may pose a threat to human health and the environment.

In the Phase I Assessment, a survey of buildings for lead-based paint should be reported. The survey should include the age of the structure, and a visual inspection for evidence of sloughing of paint chips along high activity areas such as door frames, windows, stairs, walls, and drainage ditches. Chemical analysis of dust and paint chip samples may be included, as well as X-Ray Fluorescence (XRF) data from the painted surfaces. (See Section 5.4 for discussion of analyses.) Documentation of the lead survey should be consistent with existing federal, state and local regulations for the management and mitigation of lead-based paint. Any historical soil data should be submitted in the Phase I Assessment.

If a structure is to be renovated and incorporated in the design and construction of a new school, lead-based paint impacted surfaces should either be removed or managed in place, pursuant to federal, state and local regulations and, if applicable, approved by the appropriate regulatory agencies. School districts electing to manage in place, rather than remove the lead-based paint, shall assume all liability and responsibility for managing the buildings pursuant to all applicable federal, state and local regulations.

DTSC may provide a limited further action letter to CDE after the Phase I Assessment or PEA identification of lead-based paint on buildings (see Section 3.0). DTSC will not issue final approval until after soil data have been evaluated and any necessary mitigation and/or remediation has been completed. Lead concentrations in the soil will be evaluated using the DTSC Lead Spread Model (Version 7) and the protocols outlined in the PEA Guidance Manual, to determine if further action is necessary (see Section 6.0). Further action may include further investigation and/or a response action.

If lead-based paint is identified in a structure based on laboratory analyses or XRF (see Section 5.4), or its presence is suspected based on the age of the structure, school districts should proceed with one of the soil sampling options described below in Sections 5.1 and 5.2. If a school district submits acceptable XRF data in the Phase I Assessment from building surfaces demonstrating that lead-based paint is not present

on any part of the building, soil sampling will not be required. DTSC will issue a 'no action letter' as the part of the review of the Phase I Assessment, if no other sources of contamination have been identified.

The following soil sampling strategies have been developed to assist school districts in characterizing the sites. Submittal of a workplan is optional and in general should not be necessary if one of the two strategies is followed. However, workplans are recommended for sites with deviations from these strategies or with other potential contamination.

5.1 Soil Sampling: Pre-Demolition or Renovation of Buildings

If lead-based paint has been identified in the Phase I Assessment, surface soil should be characterized surrounding structures where lead-based paint is known or suspected to be present. These soil samples should be collected from exposed soil areas around the dripline of the structures and near doors or windows prior to demolition of the buildings to determine whether there has been a release of lead to the soil. The intent of the soil sampling is to confirm whether historical weathering contributed to the release of lead into the environment.

Sampling frequency will vary depending on the size of the site, type and number of structures and conditions found. The assessment of residential and commercial properties will require the collection of samples. If the land has been uniformly residential or commercial without other identified contamination in the Phase I Assessment, a focused sampling scheme, outlined in Table 1, should be used to assess potential lead impacts on soil. The following table outlines the minimal sampling approach for sampling either pre-demolition properties or properties with buildings scheduled for renovation.

Table 1

Suggested Soil Sampling Frequency for Pre-Demolition or Renovated Buildings

Structure	Minimum sampling frequency
Single family home	Four discrete samples per home
Duplex/triplex/quadrplex residences	Six discrete samples per building
Apartment building or commercial structure	Minimum: four samples per building or one sample per 4000 sq. feet of building surface area, whichever is greater
Mixed residential land use	Consult with DTSC

Surface soil samples (0 to 6 inches, inclusive) should be collected from around the perimeter of the structure, adjacent to areas with the highest likelihood of lead deposits (under windows, doors, porches, fences and stairs, drainage areas). If concrete or asphalt borders the structure, samples should be collected from the nearest unpaved areas, including unpaved drainage areas where the run off from the paved areas may collect. The collection of samples from underneath existing paved areas may not be required depending upon the history of the property. If pavement has been removed, soil sampling in these areas should be conducted. Soil samples should be collected before removal of the buildings, prior to any grading activities, removal of foundations or slabs, or movement of soils on the site. Subsequent grading activities may affect the ability to collect representative samples, and impacted areas may be spread, increasing the lateral extent of contamination.

If lead contamination is identified in the soil surrounding the building, additional step out borings may be required on the property to determine lateral extent of contamination. Initial analyses need only be performed on surface soil samples. DTSC may require additional sampling depending on the initial soil sampling results. The DTSC project manager should be consulted to determine whether the collection of subsurface samples is necessary.

The soil data should be presented in a PEA, as described in Section 6.0, and either compared to the screening value derived from DTSC Lead Spread model (Version 7) or evaluated using the model. If DTSC determines that soil remediation is warranted, a removal or remedial action will be required.

5.2 Soil Sampling: Post-Demolition and Debris Removal

School districts may elect to proceed with controlled demolition of structures on properties where the presence or suspected presence of lead-based paint on buildings has been identified in Phase I Assessments prior to obtaining soil samples. The demolition of the buildings and the subsequent removal of the debris and associated soil may be completed before soil sampling. Soil sampling should be conducted before the site is graded for construction purposes. Surface soil samples (0-6") should be collected in the disturbed, potential source area around each former structure. If the footprint of the building is still discernable, the soil samples should be taken from around the footprint. If the building footprint is not discernable, the soil samples should be taken randomly for the disturbed area. A minimum of four samples should be collected per building. In addition, two surface soil samples should also be collected at the nearest extent of soil that has not been disturbed during the removal of the building debris. This option will be applied to all structures known or suspected to have lead-based paint, and will include all surrounding soil, irrespective of whether paving was or is present. Table 2 outlines the appropriate soil sampling frequency.

This strategy may also be applied to properties where buildings and structures have already been demolished and removed prior to the Phase I Assessment. In instances where demolition has occurred, foundations removed and soil graded or disturbed, more extensive soil sampling may be required. This may include both surface and subsurface sampling and a grid of sampling locations across the site. DTSC should be consulted for development of a workplan prior to conducting soil sampling in these instances. All sampling results should be reported in a PEA.

Table 2

Suggested Soil Sampling Frequency for Post-Demolition and Debris Removal

Structure	Minimum sampling frequency
Single family home	Four discrete samples per home
Duplex/triplex/quadruplex	Six discrete samples per building
Apartment building or commercial structure	Minimum: four samples per building or one sample per 4000 sq. feet of building surface area, whichever is greater
Additional sampling areas: undisturbed and yard areas	Minimum of two samples per building

If lead contamination is identified in the soil, additional step out borings may be required on the property to determine lateral extent of contamination. Initial analyses need only be performed on surface soil samples. DTSC may require additional sampling depending on the initial soil sampling results. The DTSC project manager should be consulted to determine whether the collection of subsurface samples is necessary. Soil sampling data will be submitted in a PEA, as described in Section 6.0. This data should be compared with the lead screening level discussed in Section 6.1. This option can only be used when lead based paint is the only identified concern on a property.

5.3 Analytical Methods for Lead

Table 3

Analytical Methods for Lead

Lead – On-site analysis	Method 6200 (XRF)
Lead – Laboratory Analyses	EPA Methods 6010B, 6020, 7420, 7421

On-site field analyses for lead on painted surfaces and soil may be conducted using field portable X-Ray Fluorescence (XRF) instrumentation. If XRF is to be employed in a site investigation, refer to the *DTSC Standard Operating Procedure (SOP) for Metals Determination in Soil by Niton 702 XRF*. The following restrictions should also be considered if the XRF is being used for site assessments.

- a)** Readings must not be taken directly off the soil. All soil samples must be prepared by screening (or sieving) to remove extraneous objects. The screen mesh should approach 25 mesh if the soil texture will allow it. The samples must be homogenized and placed into a sample cup or plastic bag suitable to the instrument.
- b)** The instrument must be calibrated per manufacturer's instructions for soil samples and a standard soil sample containing lead concentration near the screening level of 255 milligrams of lead per kilogram of soil (mg/kg) should be measured and documented.
- c)** When XRF indicates all samples are below 200 mg/kg, the highest reading sample should be analyzed by standard laboratory analysis (see Table 2). When one or more XRF results exceed 200 mg/kg then 20% of the samples (but not

less than 2) should be analyzed by standard laboratory analysis including the sample with the highest XRF reading.

5.4 Quality Control

Quality control (QC) procedures specified in SW-846 should be followed. A matrix spike/matrix spike duplicate on one soil sample per batch of samples should be performed to demonstrate that the targeted contaminants can be recovered from the soil investigated. The data should be definitive in order for risk and analytical difficulties to be properly evaluated. The laboratory data package should include a summary of the quality control sample results: blanks, matrix spike/matrix spike duplicate, surrogate recoveries, laboratory control samples, etc., as specified by the method. The laboratory should provide a narrative stating whether the QC was met and listing any discrepancies. The data should be qualified in accordance with the National Functional Guidelines of the United States Environmental Protection Agency (EPA-540R-94-012 and -013) or most recent EPA guidance (EPA QA/G-8 to be released).

6.0 PRELIMINARY ENDANGERMENT ASSESSMENT

6.1 Interpretation of Lead Data

For the initial screening for lead concentrations on a proposed school site, the highest detected concentration of lead should be compared to the screening value of 255(mg/kg or ppm) derived from the DTSC Lead Spread 7 worksheet. This screening value, which corresponds to the 99th percentile, was determined assuming exposures to children and based on a threshold blood lead concentration of 10 micrograms of lead per deciliter of blood (ug/dl), which is in accordance with Centers for Disease Control (CDC). The model input for air is based on regional and statewide air concentrations of lead, and water is based on an action level of 15 ug/l. The homegrown produce pathway is not considered a potential exposure pathway for the school sites. This screening value is applicable for the development of former residential or uncontaminated commercial properties into schools where lead, from lead-based paint, is the only potential contaminant on the property. For properties with values of lead above 255 mg/kg, the concentrations should be evaluated using the most current version of DTSC Lead Spread and presented in the PEA.

The screening number is derived based on particular considerations for proposed and existing school properties and is not necessarily relevant or appropriate for other types of site screening applications. This screening value is subject to change and revision when the DTSC Lead Spread Model is updated or other information is made available. This value is presented as a screening indicator only, and should not be

construed as a required remedial goal. If soil remediation for lead is required, the property and remedial goal will be evaluated and approved by DTSC. The DTSC Lead Spread Model is available on the internet at <http://www.dtsc.ca.gov>

6.2 PEA Document

A PEA must be completed and submitted to DTSC for approval. The format and content shall follow the PEA Guidance Manual, including amendments, with the aforementioned analyses and documentation incorporated into the report. Any additional actions, such as additional site characterization or soil removal action, which have been identified in the PEA, must follow DTSC procedures.

The PEA may include the Phase I Assessment for the background and historical portion of the document, along with the justification for selection of sampling locations, a map of the locations, and the results of the soil samples. The quality of the data should be documented to give assurance that the data is valid and appropriate for use. In addition it should include all lead abatement certification information. Lead data will be evaluated for potential health risks by comparison to the screening value in Section 6.1, or if above this value, by use of the Lead Spread Model (Version 7).

APPENDIX A

Statutes and Regulations for Asbestos Containing Materials (ACM) and Lead-Based Paint

The following are summaries of pertinent regulations and statutes concerning ACM and lead-based paint mitigation. The list is not necessarily inclusive of all federal, state, or local requirements.

ASBESTOS

Federal Regulations

Asbestos Standard for the Construction Industry. 29 Code of Federal Regulations (CFR) Part 1926.1101.

Asbestos Standard. 29 CFR Part 1910.1001.

Respiratory Protection Standard. 29 CFR Part 1910.134.

California Regulations

Cal/OSHA Asbestos Standard. Title 8, California Code of Regulations (CCR), Article 4, Section 1529.

Cal/OSHA Asbestos Standard. Title 8, CCR, Article 110, Section 5208.

Cal/OSHA. Title 8, CCR, Article 2.5, Section 341.6 et seq.

Cal/OSHA Injury and Illness Prevention Program Standard. Title 8, Sections 1509 and 3203.

Owner Requirements. Business and Professional Code, Division 3, Chapter 9, Article 11, Section 7180 et seq.

Hazardous Substance Removal Criteria. Health and Safety Code Section 25914.1-3.

Asbestos Notification Act. Health and Safety Code Section 25915 et seq.

Real Estate Disclosure. Health and Safety Code Section 25359.7

Building Owners Responsibilities. California Labor Code Section 6501.9.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)

Building Demolition. Health and Safety Code Section 19827.5.

LEAD-BASED PAINT

Lead-Safe Schools Protection Act of 1992. California Education Code, Sections 32240-32234.

Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards. Title 17, California Code of Regulations, Section 35001, et. seq.

Cal/OSHA Lead in Construction Standard. Title 8, California Code of Regulations, Section 1532.1.

Federal Lead Contamination Control Act of 1988. Title 42, United States Code, Section 300j-21.

Cal/OSHA Injury and Illness Prevention Program Standard. Title 8, California Code of Regulations, Sections 1509 and 3203.

Cal/OSHA Hazard Communication Standard. Title 8, California Code of Regulations, Section 5194.

Federal Toxic Control Act (TSCA) of 1976. Title 15, United States Code, Section 2601 et seq.

For additional information or text of laws and regulations go to:

<http://www.dhs.ca.gov/childlead>

<http://www.dir.ca.gov/>

<http://www.epa.gov/lead/>